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REMARKS

Favorable reconsideration is respectfully requested in view of the above amendments and following remarks. Claims 6, 8 and 11 have been amended. The amendment to claim 6 is supported by the original disclosure, for example, at page 1, lines 1-5, page 6, lines 10-12 and Examples 3-8. Claims 8 and 11 have been amended editorially. Claims 18-21 are new. Claims 18-20 are supported by previous claim 8. Claim 21 generally tracks claim 6 and is supported by the original disclosure, for example, at page 1, lines 1-5, page 6, lines 10-12 and Examples 3-8. No new matter has been added. Claims 6-8, 11 and 18-21 are pending.

Claim Rejections – 35 USC §112

Claim 11 is rejected under 35 USC 112, second paragraph, as being indefinite. Claim 11 recites that the nutritive solution is provided dropwise to the roots or that hydroponics are utilized to provide the nutritive solutions to the roots. Applicants submit that claim 11 is definite.

Claim Rejections – 35 USC §102

Claims 6 and 8 are rejected under 35 USC 102(b) as being anticipated by Narin et al. made evident by the teachings of Lahaye et al. (WW; Lahaye, M. et al. Carbohydrate Research, (1994), 262: 115-125. *Chemical characteristics of insoluble glucans from the cell wall of the marine green alga Ulva lactuca* (L.) *Thuret.*) and Bi et al. (UU; Bi, F. et al. Pak. J. Bot. (1999), 31(1): 193-198. *Studies on aqueous extracts of three green algae as an elicitor of plant defence mechanism.*). Applicants respectfully traverse the rejection.

Nairn relates to a tissue culture method, and addresses a phenomenon observed only in tissue cultures where the plants have an abnormal, water-soaked, or glassy appearance when the plants are grown *in vitro*. Nairn teaches that in their method, an anti-vitrification agent is added in an amount so as to inhibit the vitrification of the plants in tissue culture. Nairn clearly defines "tissue culture" as the growth of cells including tissues and small pieces of tissue, outside the plant in artificial media.

On the other hand, claim 6 is directed to a method for activating plant defense and resistance reactions against biotic or abiotic stresses *in vivo*, as opposed to in a tissue culture. Claim 6 recites that the administration to the plants is effected under *in vivo* conditions, as

opposed to outside the plant in artificial media. Nothing in Nairn teaches or suggests the features of claim 6. Accordingly, claim 6 and its dependent claims are patentable over Nairn.

The rejection contends that Bi teaches preparing an extract of *Ulva lactuca* by acid hydrolysis of the algae and applying the extract of *Ulva lactuca* to cotyledons and teaches that the acid hydrolysis product was obtained by washing, milling and sequential extraction in water, dilute sodium hydroxide and hydrochloric acid and ethanol precipitation and freeze-drying, as well as acid hydrolysis, and therefore, Bi anticipates the claimed subject matter. Applicants respectfully submit that the rejection's analysis of Bi is incorrect.

In particular, Bi does not teach administering acid hydrolyzed extract of *Ulva lactuca* to cotyledons. Specifically, Bi teaches that the acid alkali or aqueous extracts (cold/hot) were treated with ethanol to precipitate out the polysaccharides, and the precipitate was separated and freeze-dried so as to prepare the High Molecular Weight Crude Elicitor Preparations (HMWCEP; see page 194 under Crude Elicitor Preparations from Seaweed Extracts). Bi indicates that these high molecular weight crude elicitor preparations were evaluated for their elicitor activity (see page 193, last three lines of last paragraph).

Bi further teaches that these preparations were prepared for separation using paper chromatography in order to analyze the monosaccharide composition of the polysaccharides within these preparations. In particular, Bi teaches hydrolyzing these preparations with acid, drying, and then separating the hydrolysates by paper chromatography (see page 194 under Acid Hydrolysis and Monosaccharide Composition of HMWCEP and page 196, middle paragraph). It is clear from the above discussion that Bi teaches that HMWCEP, as opposed to their hydrolysates, were applied to the cotyledons and does not disclose that the hydrolysates were used other than for analyzing the composition of the HMWCEP, let alone disclose that ulvans were hydrolyzed and applied to plants. Therefore, Bi fails to teach administering an effective amount of the reaction product obtained from hydrolysis or enzymatic hydrolysis of ulvans extracted from green algae of the genus *Ulva* or *Enteromorpha* for activating plant defense and resistance reactions against biotic or abiotic stresses as recited in claim 6. Accordingly, Bi does not anticipate claim 6 and its dependent claims.

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Claims 6-8 are rejected under 35 USC 103(a) as being unpatentable over Bi et al. Applicants respectfully traverse the rejection.

Applicants submit that Bi fails to provide any reason to expect that hydrolysates of ulvan extracts would activate plant defense and resistance reactions against biotic or abiotic stresses.

In particular, Bi teaches comparative results between cold or hot alkali, acid or aqueous extracts of *U. lactulus*. As shown in Table 3, only the hot aqueous fractions of *U. lactulus* showed sufficient browning. As shown in Table 2, the hot aqueous fractions contained lower amounts of uronic acid, which are essential components of ulvans, as compared to that of cold aqueous fractions, which showed the same amount of browning as that of the control. Thus, one would question whether ulvans in fact are responsible for the browning effect.

Moreover, as discussed above, Bi teaches the application of high molecular weight crude elicitor preparations, and is silent as to application of their hydrolyzed components. Accordingly, Bi fails to provide any experimental data or any guidance as to whether hydrolysates of ulvan extracts would activate plant defense and resistance reactions against biotic or abiotic stresses as recited in claim 6 with a reasonable expectation of success. Therefore, claim 6 and its dependent claims are patentable over Bi.

Claim 21 is directed to a method for activating, *in vivo*, plant defense and resistance reactions against biotic stresses. Claim 21 recites administering, to living plants, an effective amount of (1) ulvans extracted from green algae of the genus *Ulva* or *Enteromorpha*, or (2) a reaction product obtained from hydrolysis or enzymatic hydrolysis of the ulvans of (1). Claim 21 further recites that the administration to the plants is effected under *in vivo* conditions. The references do not teach or suggest the features of claim 21, and therefore, claim 21 is patentable over the references.

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In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions or concerns regarding this communication can be directed to the attorney-of-record, Douglas P. Mueller, Reg. No. 30,300, at (612) 455.3804.

Respectfully submitted,

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Dated: Sept. 18, 2009

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